Invasive Species Early Detection Monitoring Protocol for Klamath Network Parks

Standard Operating Procedure (SOP) #1: Invasive Species Prioritization

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Revision History Log:

Previous Version	Revision Date	Author	Changes Made	Reason for Change	New Version

This SOP summarizes the prioritization of invasive species to be monitored under the invasive species protocol. Nomenclature follows the Jepson Manual of California Vegetation (1993, University of California Press). The prioritization of species addresses the desire to focus management efforts on a subset of the total species pool where these efforts will be most effective. A detailed report explaining the prioritization process is presented in Appendix A. Therefore, only a brief summary of these methods is provided in this SOP. The prioritization process ranked numerous species for potential monitoring. The list of species to be monitored was developed using this ranking. In parks with a large number of ranked species (Redwood and Whiskeytown), the number of species selected for monitoring is much less than the potential number of invasives, as explained below.

In the future, new invasives will arrive in parks, while the status of existing invasives may change. These new invasives will need to be considered for prioritization or re-prioritized according to the process described at the end of this SOP.

Prioritization Process

The Network's prioritization process was undertaken by Robert Klinger, USGS, with input from park and Network staff. Species prioritization was done differently among Klamath Network parks according to the information available at each park. The prioritization was completed with the benefit of existing quantitative data and expert opinion for Lava Beds and Whiskeytown, where the most data were available. For other parks, expert opinion in concert with existing literature was used to prioritize species. For each park, a list of invasive species in the park, with additional species that could invade based on the literature, was finalized. Then the following steps were taken for prioritization:

1. The park list of non-native species was divided into invasive and non-invasive species. Non-invasive species were those that, based on experience of park managers CAL-IPPC

ratings, would not become ecosystem transformers. We erred on the side of including species in the ranking, especially the many species for which invasiveness is not yet known.

2. The Analytical Hierarchy Process (Saaty 1977), was used to rank species based on the relative importance of four criteria and 20 subcriteria for species in different phases of the invasion process: 1) colonization, 2) establishment, 3) spread/equilibrium. These are defined briefly as follows. Species in the colonization phase were in areas adjacent to or near the NPS units but not yet within its boundaries, or they could have just recently colonized a small portion of the unit. Species in the establishment phase had multiple, relatively small, localized populations within the boundaries of a unit. Species in the spread/equilibrium phase were more widely distributed than those in the establishment phase. See Appendix A, Prioritization of Non-native Plants in the National Park Service Klamath Network using Weighted Criteria and Measures of Uncertainty, by R. Klinger and M. Brooks for more detailed definitions.
3. The criteria and subcriteria are based on Randall et al. (in press), described in Appendix A.
4. Pre-existing data and expert opinion were used to determine the phase of the invasion process for individual species.
5. The California Invasive Plant Council (Cal IPC) system, pre-existing data, and expert opinion were used to assign scores to species in different phases of the invasion process: colonization, establishment, and equilibrium.
6. Uncertainty scores in terms of a species' invasion, spread and management potential, and other factors were assigned at two levels in the Randall-based scheme: criteria and subcriteria.
7. Analytical hierarchy software was used to generate the scores and to evaluate the rankings (Appendix A). The software used was Criterium Decision Plus 3 http://www.infoharvest.com/ihroot/index.asp.
7. Comparisons were made with rankings for Randall et al. (in press) scores generated without division into phases of invasion or use of the Analytical Hierarchy Process.
8. Comparisons were made with expert opinions about what species to monitor for early detection and other monitoring goals.

With new invasions, control of existing invasions, changes in species' abundance, and new understanding of the threats particular species pose, prioritizations may need to be adjusted in the future. Another consideration is the difficulty of applying the prioritization across heterogeneous landscapes. One of the most important values of an early detection program is to alert managers to the presence of species that they would likely manage, in areas where they are not known to be. While the prioritization helps considerably by identifying species that fit this description park-wide, there are some species that may be classified into the equilibrium phase (and thus not prioritized for early detection monitoring park-wide), which are best regarded as colonizers in remote parts of the park. In order to address the potential need to document such equilibrium species in some areas, the Crew Lead will consult with the Park Contact for invasive species, but

will make the final decision on sampling for equilibrium species. Those sample units in which particular equilibrium species should be searched for along with colonization and establishment species will be identified (the full monitoring protocol will not be done for equilibrium species; only their location and the size of the infestation will be recorded via GPS).

The classification of species into three phases of invasion and their rankings within the classes were put to the test at Redwood National and State Parks. An experienced botanist and invasive species specialist, Dr. Ayzik Solomeshch, along with a less experienced field assistant, spent 6 weeks monitoring to test this invasive species early detection protocol. They covered over 100 km of trails and roads. Dr. Solomeshch recommended a few changes, as discussed in Appendix A, the pilot study report. The initial species list at each park will require refinement. Therefore, the first reprioritization should occur after the first field season, and thereafter in association with Analysis and Synthesis Reports at 6 year intervals.

The prioritization of species at each park was sent for review to park staff expert in invasive plants. Changes suggested by park staff, or Dr. Solomeshch, have been incorporated into the lists below. Equilibrium species that warrant monitoring in backcountry areas are also listed. Backcountry areas are defined differently for each park as described below.

Priority Species for Crater Lake

At Crater Lake, prioritization relied heavily on the expert opinion of park Terrestrial Ecologist Michael Murray. Thirteen of the sixty non-native plant species were classified into the colonization phase, nine into the establishment phase, and seven into the spread/equilibrium phase. The remaining species were not considered invasive and were not ranked. Because of the relatively small number of species in the colonization and establishment phases of invasion, all but one were selected for park-wide monitoring (Table 1). The species not selected, perennial ryegrass (*Lolium perenne*), had a particularly low score of 1.98. The six equilibrium species are listed in Table 2. For many of these, all locations of existing infestation locations are believed known. The park will therefore be interested in any new locations for any of these species. Therefore, backcountry areas at Crater Lake include the entire park that will be monitored.

Table 1. Prioritized invasive species list for park-wide monitoring at Crater Lake National Park.

Scientific Name	Common Name	Invasion Phase	Ranking Score
Cytisus scoparius	Scotch Broom	Colonization	0.875
Centaurea solstitialis	Yellow Starthistle	Colonization	0.873
Centaurea maculata	Spotted Knapweed	Colonization	0.854
Bromus tectorum	Cheatgrass	Establishment	0.827
Holcus lanatus	Velvet Grass	Colonization	0.769
Centaurea diffusa	Diffuse Knapweed	Colonization	0.750
Linaria genistifolia ssp. dalmatica	Yellow Toad Flax	Colonization	0.744
Leucanthemum vulgare	Ox-eye Daisy	Colonization	0.740
Cirsium arvense	Canada Thistle	Establishment	0.642
Brassica rapa	Mustard	Colonization	0.610
Melilotus albus	White sweet clover	Colonization	0.591
Hypochaeris radicata	Rough Cat's Ear	Establishment	0.564
Poa bulbosa	Bulbous Bluegrass	Colonization	0.556
Festuca arundinacea	Tall Fescue	Establishment	0.538

Table 1. Prioritized invasive species list for park-wide monitoring at Crater Lake National Park (continued).

Scientific Name	Common Name	Invasion Phase	Ranking Score
Melilotus officinalis	Sweet Clover	Colonization	0.532
Bromus inermis	Smooth Brome	Establishment	0.507
Dactylis glomerata	Orchard grass	Establishment	*0.499*
Lactuca serriola	Wild Lettuce	Establishment	0.477
Tragopogon dubius	Goat's Beard	Establishment	0.401
Agrostis gigantea	Bentgrass	Establishment	0.393
Senecio sylvaticus	Ragweed	Colonization	0.322

Table 2. Equilibrium species in Crater Lake National Park and status of which species will be monitored in the backcountry, and which will not be, for the reason given.

Scientific Name	Common Name	Ranking Score	Monitor in Backcountry?
Hypericum perforatum	Klamath Weed	0.673	Y
Cirsium vulgare	Bull Thistle	0.667	Y
Verbascum thapsus	Common Mullein	0.657	Y
Rumex acetosella	Sheep Sorrel	0.545	N(control infeasible)
Poa pratensis	Kentucky Bluegrass	0.532	N(control infeasible)
Taraxacum officinale	Dandelion	0.517	N(control infeasible)

Priority Species for Lassen Volcanic National Monument

Prioritization at Lassen was based on expert opinion, and benefited greatly from Park Ecologist Michelle Cox. Of the 83 non-native plants considered for ranking at Lassen, 23 were classified as being in the colonization and establishment phases. With relatively few colonization and establishment species, all having relatively high ranking scores, all were included in park-wide monitoring for early detection (Table 3). An additional 10 species were placed in the equilibrium phase whose infestations may be documented in backcountry portions of the park (Table 4). Backcountry areas at Lassen have been defined as the existing wilderness areas.

Table 3. Prioritized invasive species list for park-wide monitoring at Lassen Volcanic National Park.

Scientific Name	Common Name	Invasion Phase	Ranking Score
Taeniatherum caput-medusae	Medusahead	Colonization	0.920
Lythrum salicaria	Purple Loosestrife	Colonization	0.901
Genista monspessulana	French Broom	Colonization	0.895
Cytisus scoparius	Scotch Broom	Colonization	0.875
Centaurea solstitialis	Yellow Starthistle	Colonization	0.873
Euphorbia esula	Leafy Spurge	Colonization	0.866
Centaurea maculosa	Spotted Knapweed	Colonization	0.854
Onopordum acanthium	Scotch Thistle	Colonization	0.848
Bromus tectorum	Cheatgrass	Establishment	0.827
Rubus armeniacus	Himalaya Berry	Establishment	0.823
Lepidium latifolium	Broadleaved Pepperweed	Establishment	0.812
Phalaris arundinacea	Giant Reed Grass	Establishment	0.798
Halogeton glomeratus	Halogeton	Colonization	0.789
Isatis tinctoria	Dyer's Woad	Colonization	0.770
Carduus pycnocephalus	Italian Thistle	Colonization	0.769
Hirschfeldia incana	Mediterranean Mustard	Colonization	0.755
Centaurea diffusa	Diffuse Knapweed	Colonization	0.750

Table 3. Prioritized invasive species list for park-wide monitoring at Lassen Volcanic National Park (continued).

Scientific Name	Common Name	Invasion Phase	Ranking Score
Acroptilon repens	Russian Knapweed	Colonization	0.749
Carduus nutans	Musk Thistle	Colonization	0.748
Chondrilla juncea	Skeleton Weed	Colonization	0.748
Centaurea virgata	Squarrose Knapweed	Colonization	0.744
Cardaria draba	Hoary Cress	Colonization	0.741
Linaria genistifolia ssp. dalmatica	Dalmation Toadflax	Establishment	0.713
Holcus lanatus	Velvet Grass	Establishment	0.650
Cirsium arvense	Canada Thistle	Establishment	0.634
Poa bulbosa	Bulbous Bluegrass	Establishment	0.619
Phleum pratense	Timothy	Establishment	0.607

Table 4. Equilibrium species in Lassen Volcanic National Park and status of which species will be monitored in the backcountry, and which will not be, for the reason given.

Scientific Name	Common Name	Ranking Score	Monitor in Backcountry?
Cirsium vulgare	Bull Thistle	0.679	Y
Verbascum thapsus	Common Mullein	0.655	Y
Tragopogon dubius	Goat's Beard	0.595	Y
Vulpia myuros	Vulpia	0.550	N(control infeasible)
Poa pratensis	Kentucky Bluegrass	0.530	N(control infeasible)
Lactuca serriola	Wild Lettuce	0.496	N(control infeasible)
Taraxacum officinale	Dandelion	0.494	N(control infeasible)
Poa annua	Annual Bluegrass	0.421	N(control infeasible)
Plantago lanceolata	English Plantain	0.414	N(control infeasible)
Plantago major	Common Plantain	0.404	N(control infeasible)

Priority Species for Lava Beds

A combination of plot sampling data and expert opinion was used to develop the prioritization for Lava Beds. Dave Hays, who conducts invasive species monitoring throughout the summers in the park, provided expert opinion. A total of 44 non-native plant species were considered for ranking. Of these, three were classified as being in the colonization phase, 14 in the establishment phase, and 13 species classified into the spread/equilibrium phase. With relatively few colonization and establishment species, all can be included in park-wide monitoring for early detection (Table 5). Spread/equilibrium species are shown in Table 6. Some of these species are too ubiquitous to monitor in backcountry area, as indicated. Backcountry areas of Lava Beds are defined as existing wilderness.

Table 5. Prioritized invasive species list for park-wide monitoring at Lava Beds National Monument.

Scientific Name	Common Name	Invasion Phase	Ranking Score
Lepidium latifolium	Broad-leaved pepperweed	Colonization	0.917
Centaurea solstitialis	Yellow Starthistle	Establishment	0.776
Linaria genistifolia ssp. dalmatica	Dalmation Toadflax	Establishment	0.712
Taeniatherum caput-medusae	Medusahead	Establishment	0.696
Thlaspi arvense	Penny-Cress	Colonization	0.622
Cirsium arvense	Canada Thistle	Establishment	0.612

Table 5. Prioritized invasive species list for park-wide monitoring at Lava Beds National Monument (continued).

Scientific Name	Common Name	Invasion Phase	Ranking Score
Melilotus officianalis (and albus)s	Yellow Sweetclover	Colonization	0.591
Isatis tinctoria	Dyer's Woad	Establishment	0.532
Torilis arvensis	Hedge Parsley	Establishment	0.530
Salsola tragus	Russian Thistle	Establishment	0.527
Kochia scoparia	Kochia	Establishment	0.461

Table 6. Equilibrium species in Lava Beds National Monument and status of which species will be monitored in the backcountry, and which will not be, for the reason given.

Scientific Name	Common Name	Ranking Score	Monitor in Backcountry?
Bromus tectorum	Cheatgrass	0.618	N (ubiquitous)
Descurainia sophia	Pinnate Tansymustard	0.611	Y
Cirsium vulgare	Bull Thistle	0.609	Y
Verbascum thapsus	Common Mullein	0.584	Y
Tragopogon dubius	Goat's Beard	0.582	Y
Marrubium vulgare	Horehound	0.508	Y
Poa bulbosa	Bulbous Bluegrass	0.495	N(control infeasible)
Lepidium perfoliatum	Clasping Pepperweed	0.491	Y
Lactuca serriola	Wild Lettuce	0.479	N(control infeasible)
Urtica diocia	Nettle	0.418	N(potentially native)
Vulpia bromoides	Vulpia	0.404	N(ubiquitous)
Erodium cicutarium	Filaree	0.388	N(control infeasible)
Holosteum umbellatum	Jagged Chickweed	0.341	N(control infeasible)
Sisymbrium altissimum	Tumble Mustard	0.306	N(control infeasible)
Galium aparine	Bedstraw	0.259	N(possibly native)

Priority Species for Oregon Caves

Habitats at Oregon Caves overlap with those at Crater Lake, Redwood, and Whiskeytown. Therefore, all invasives were included for ranking if they occurred at these parks as well as Oregon Caves (Table 7). There was also one non-native plant species that has been documented at Oregon Caves but not at Whiskeytown, Redwood, or Crater Lake. This species, Mexican daisy (*Erigeron karvinskianus*), is not considered invasive by the California Invasive Pest Plant Council, nor other sources. Therefore, it was not prioritized.

Table 7. Prioritized invasive species list for park-wide monitoring at Oregon Caves National Monument.

Scientific Name	Common Name
Bromus tectorum	Cheatgrass
Cirsium vulgare	Bull Thistle
Dactylis glomerata	Orchardgrass
Festuca arundinacea	Tall Fescue
Holcus lanatus	Velvet Grass
Hypericum perforatum	Klamath Weed

Priority Species for Redwood

At Redwood, expert opinion of park managers, particularly Stassia Samuels, was a key to developing the prioritization. Of the 275 non-native plant species considered for ranking at Redwood NP, 226 were determined not to pose serious threats or be in need of monitoring. Thirteen of the remaining species were then classified as being in the colonizing phase, 22 in the establishment phase, and 19 in the equilibrium phase. In both the colonization and establishment rankings, scores decreased gradually with rank to 0.45-0.50. Scores decreased rapidly thereafter for the remaining species, indicating they are much less of an ecological threat. Therefore, all colonization and establishment species with a score of greater than .45 were selected for park-wide monitoring. Table 8 lists these species. A number of equilibrium species may also be considered for documenting in select, remote areas of the park (Table 9). These areas have not yet been defined.

Based on the pilot study and expert opinion of park staff who reviewed the rankings and classification *post hoc*, two equilibrium species should be considered to be in the establishment phase of invasion, and monitored park-wide: Scotch broom (*Cytisus scoparius*) and holly (*Ilex aquifolium*). Two species in the establishment phase of invasion are no longer considered important ecological threats, and do not need to be monitored: common mullein (*Verbascum thapsus*) and one seed hawthorne (*Crataegus monogyna*). Conversely, two species now appear to be greater threats than at the time of the ranking and should be monitored: Three-cornered leek (*Allium triquetrum*) and herb Robert (*Geranium robertianum*).

Table 8. Prioritized invasive species list for park-wide monitoring at Redwood National Park.

Scientific Name	Common Name	Invasion Phase	Ranking Score
Ulex europaeus	Gorse	Colonization	.85
Cortaderia spp.	Pampas Grass	Colonization	.83
Centaurea solstitialis	Yellow Starthistle	Colonization	.80
Hypericum perforatum	St. Johnswort	Establishment	.76
Delairea odorata	Cape Ivy	Establishment	.75
Lupinus arboreus	Yellow Bush Lupine	Colonization	.75
Cytisus scoparius	Scotch Broom	Establishment	.70
Cirsium arvense	Canada Thistle	Establishment	.67
Linaria genistifolia ssp. dalmatica	Dalmation Toadflax	Establishment	.67
Carpobrotus chilensis	Sea Fig	Establishment	.66
Polygonum cuspidatum-and *P. polystachyum*	Japanese Knotweed	Colonization	.65
Foeniculum vulgare	Fennel	Establishment	.64
Centaurea maculosa	Spotted Knapweed	Establishment	.61
Verbascum thapsus	Common Mullein	Colonization	.61
Crataegus monogyna	Oneseed Hawthorn	Colonization	.58
Acacia dealbata	Mimosa	Establishment	.56
Rubus laciniatus	Cut Leaved Blackberry	Establishment	.54
Ilex aquifolium	Holly	Equilibrium	.53
Polygonum sachalinense	Giant Knotweed	Establishment	.52
Erica lusitanica	Spanish Heath	Establishment	.50
Prunus avium	Sweet Cherry	Establishment	.49
Robinia pseudoacacia	Black Locust	Establishment	.46
Park Additions			
*Allium triquetrum***	Three-cornered Leek		

Table 8. Prioritized invasive species list for park-wide monitoring at Redwood National Park (continued).

Scientific Name	Common Name	Invasion Phase	Ranking Score
*Geranium robertianum***	Herb Robert		

*Pampas grasses *(Cortaderia selloana* and *C. jubata)* are nearly identical, and both species are managed identically by the park. Therefore, we combined then for monitoring.
**The latest information suggests that this ranked species may be more of a threat than recognized at the time of prioritization.

Table 9. Equilibrium species at Redwood National Park and status of which species will be monitored in the backcountry, and which will not be, for the reason given.

Scientific Name	Common Name	Ranking Score	Monitor in Backcountry?
Pinus radiata	Monterey Pine	0.789	Y
Ammophila arenaria	European Beach Grass	0.788	N(found on all dunes)
Rubus discolor	Himalaya Berry	0.757	Y
Genista monspessulana	French Broom	0.691	Y
Cirsium vulgare	Bull Thistle	0.667	Y
Hedera helix-	English Ivy	0.667	Y
Senecio jacobaea	Tansy Ragwort	0.601	Y
Phalaris aquatica	Harding Grass	0.598	Y
Silybum marianum	Milk Thistle	0.557	Y
Phalaris arundinacea	Reed Canary Grass	0.535	Y
Vinca major	Periwinkle	0.526	Y
Cotoneaster spp.	Cotoneaster	0.517	Y
Dipsacus fullonum	Wild Teasel	0.508	Y
Digitalis purpurea	Foxglove	0.480	Y
Festuca arundinacea	Tall Fescue	0.467	Y

Priority Species for Whiskeytown

Prioritization of species at Whiskeytown was accomplished using a variety of plot data, as well as expert opinion. Jennifer Gibson, Windy Bunn, Mike Commons, and Gretchen Ring, park ecologists and botanists, all contributed expert opinion to the species classifications and rankings. Of the 208 non-native plant species considered for ranking, 65 were considered serious threats. Fourteen of these were classified into the colonizing phase, 27 into the establishment phase. Because of the relatively high rankings, 25 species were prioritized for park-wide early detection monitoring (Table 10). There were also a large number of equilibrium species. Many of these were low ranking (Table 11). The equilibrium species indicated in Table 11 will be monitored in backcountry areas, defined for Whiskeytown as trailsides above2500 feet in elevation.

Based on expert opinion of park staff who reviewed the rankings and classification post hoc, there are some minor changes noted in the tables below. These are based on information from the region that was not available when the classification and ranking were done in 2005. Most importantly, annual ryegrass (*Lolium multiflorum*), like other annual grasses, does not need to be monitored, and four species should be monitored park-wide that would otherwise not be: Diffuse knapweed (*Centaurea diffusa*) and dyer's woad (*Isatis tinctoria)* now appear to be a much greater threat; tree of Heaven (*Ailanthus altissima*) has been largely controlled, should be classified in the establishment phase of invasion, and should be monitored; and finally, one species, sesbania (*Sesbania exaltata*), has recently began invading riparian areas in the Whiskeytown region.

Table 10. Prioritized invasive species list for park-wide monitoring at Whiskeytown National Recreation Area.

Scientific Name	Common Name	Invasion Phase	Ranking Score
Tamarix spp.-	Tamarisk	Colonization	0.919
Lepidium latifolium	Broad-leaved Pepperweed	Colonization	0.917
Lythrum salicaria	Purple loosestrife	Colonization	0.901
Delairea odorata	Cape Ivy	Colonization	0.893
Euphorbia esula	Leafy Spurge	Colonization	0.866
Centaurea maculosa	Spotted Knapweed	Colonization	0.854
Ulex europaeus	Gorse	Colonization	0.848
Genista monspesullana	French Broom	Establishment	0.824
Cytisus scoparius	Scotch Broom	Establishment	0.816
Ailanthus altissima	Tree of Heaven	Establishment	0.800
Cotoneaster pannosa	Cotoneaster	Colonization	0.783
Aegilops triuncialis	Barbed Goat Grass	Establishment	0.782
Arundo donax	Giant Arundo	Colonization	0.774
Festuca arundinacea	Tall Fescue	Colonization	0.769
Cynaria cardunculus	Artichoke Thistle	Colonization	0.757
Spartium junceum	Spanish Broom	Establishment	0.756
Cirsium arvense	Canada Thistle	Colonization	0.744
Anthoxanthum odoratum	Vernal Grass	Colonization	0.743
Leucanthemum vulgare	Ox-Eye Daisy	Colonization	0.740
Poa pratensis	Kentucky Bluegrass	Establishment	0.729
Foeniculum vulgare	Fennel	Colonization	0.713
Linaria genistifoliassp. dalmatica	Dalmation Toadflax	Establishment	0.713
Brassica tournefortii	Mustard	Establishment	0.708
Park Additions			
*Centaurea diffusa**	Diffuse Knapweed		
*Sesbania exaltata***	Sesbania		
*Isatis tinctoria**	Dyer's Woad	Establishment	

*The latest information suggests that this ranked species may be more of a threat than recognized at the time of prioritization.
**A new invader that is a serious threat in riparian areas on public lands. It was not ranked because this was not known at the time of prioritization.

Table 11. Equilibrium species that may be monitored in select locations at Whiskeytown and status of which species will be monitored in the backcountry, and which will not be, for the reason given.

Scientific Name	Common Name	Monitor in Backcountry?	Ranking
Ailanthus altissima	Tree of Heaven	Y	0.799
Centaurea solstitialis	Yellow Starthistle	Y	0.765
Rubus discolor	Himalaya Berry	Y	0.751
Verbascum thapsus	Common Mullein	Y	0.655
Centaurea melitensis	Tocalote	Y	0.647
Conium maculatum	Wild Hemlock	Y	0.621
Cirsium vulgare	Bull Thistle	Y	0.605
Bromus tectorum	Cheatgrass	N(control infeasible)	0.587
Trifolium hirtum	Rose Clover	Y	0.568

Bromus rubens	Red Brome	N(control infeasible)	0.561
Vulpia myuros	Annual fescue	N(control infeasible)	0.561
Hypericum perforatum	Klamath Weed	N(control infeasible)	0.557
Cynosurus echinatus	Dogtail Grass	N(control infeasible)	0.553

Table 11. Equilibrium species that may be monitored in select locations at Whiskeytown and status of which species will be monitored in the backcountry, and which will not be, for the reason given (continued).

Scientific Name	Common Name	Monitor in Backcountry?	Ranking
Avena barbata	Wild Oats	N(control infeasible)	0.551
Cynodon dactylon	Bermuda Grass	Y	0.549
Daucus carrotta	Wild Carrot	Y	0.548
Avena fatua	Wild Oats	N(control infeasible)	0.547
Verbascum blattaria	Moth Mullein	Y	0.545
Rumex acetosella	Sheep Sorrel	N(control infeasible)	0.543
Bromus diandrus	Ripgut Brome	N(control infeasible)	0.497
Bromus hordeaceus	Soft Chess5	N(control infeasible)	0.492
Melilotus albus	White Sweetclover	N(control infeasible)	0.485

Revising the Prioritization

Following the first field season, and then every 5 years as part of the Analysis and Synthesis Reports, the prioritization will be revisited. Any new invasive species of concern for the parks will be run through the prioritization process (Appendix A). Existing prioritized species will also be reviewed and any species whose classification or ranking appears suspect will be re-evaluated. The new ranking and classification data will be added to the existing database archived at the Klamath Network (SOP #8: Data Transfer, Storage, and Archive). These databases are set up to feed directly into the ranking software. The software Criterium Decision Plus 3 (http://www.infoharvest.com/ihroot/index.asp) will again be used to rerun the calculations with the new data. The rankings produced by the analytical hierarchy process will again be evaluated by park and network specialists and species whose new ranking scores are sufficiently high to merit inclusion in the list of invasive species for park-wide monitoring, as described above for each park, will be included.

Literature Cited

Saaty, T. 1980. The Analytic hierarchy process: Planning, priority setting, resource allocation. McGraw-Hill Inc., New York.

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